

114 SOLAR PHYSICS

*A Journal for Solar Research and the Study of
Solar Terrestrial Physics*

VOLUME 5 (1968)



D. REIDEL PUBLISHING COMPANY

DORDRECHT-HOLLAND

© 1968. D. Reidel Publishing Company, Dordrecht, Holland
No part of this book may be reproduced in any form, by print, photoprint,
microfilm, or any other means, without permission from the publisher

Printed in The Netherlands by D. Reidel, Dordrecht

EDITORS

C. DE JAGER

Universities of Utrecht and Brussels

Z. ŠVESTKA

Czechoslovak Academy of Sciences

EDITORIAL BOARD

H. Alfvén, *Stockholm*

R. G. Athay, *Boulder*

J. M. Beckers, *Sacramento Peak*

L. Biermann, *München*

D. E. Blackwell, *Oxford*

H. A. Brück, *Edinburgh*

A. Bruzek, *Freiburg i. Br.*

V. Bumba, *Ondřejov*

A. Dollfus, *Meudon*

J. W. Evans, *Sacramento Peak*

J. W. Firor, *Boulder*

A. D. Fokker, *Utrecht*

H. Friedman, *Washington*

R. Giovanelli, *Sydney*

M. N. Gnevyshev, *Kislovodsk*

L. Goldberg, *Cambridge, Mass.*

J. Houtgast, *Utrecht*

R. F. Howard, *Pasadena*

F. W. Jäger, *Potsdam*

J. T. Jefferies, *Honolulu*

K. O. Kiepenheuer, *Freiburg i. Br.*

J. Kleczek, *Ondřejov*

V. A. Krat, *Pulkovo*

R. M. Kundu, *Bombay*

A. Maxwell, *Cambridge, Mass.*

R. Michard, *Meudon*

O. C. Mohler, *Ann Arbor*

G. Newkirk Jr., *Boulder*

J. C. Noyes, *Seattle*

R. W. Noyes, *Cambridge, Mass.*

Y. Öhman, *Saltsjöbaden*

E. N. Parker, *Chicago*

A. Keith Pierce, *Kitt Peak*

S. B. Pikel'ner, *Moscow*

G. Righini, *Firenze*

J. Rösch, *Bagnères-de-Bigorre*

A. B. Severny, *Crimea*

W. E. Stepanov, *Irkutsk*

Z. Suemoto, *Tokyo*

T. Takakura, *Mitaka*

R. Tousey, *Washington*

W. Unno, *Tokyo*

M. Waldmeier, *Zürich*

J. P. Wild, *Sydney*

H. Zirin, *Pasadena*

TABLE OF CONTENTS

Editorial	259
ARTICLES	
ALTROCK, Richard C. / A New Method for the Analysis of Equivalent Widths and its Application to Solar Photospheric Oxygen	260
ALTSCHULER, Martin D., Carl G. LILLIEQUIST, and Yoshinari NAKAGAWA / A Possible Acceleration Mechanism for a Solar Surge	366
ARGO, H. V., J. A. BERGEY, W. D. EVANS, and S. SINGER / 16-40 Å Coronal X-Ray Emission during the 12 November 1966 Eclipse	551
BASU, D. and A. E. COVINGTON / An Index of Impulsiveness for 2800 MHz Impulsive Solar Noise Bursts	102
BECKERS, J. M. / Principles of Operation of Solar Magnetographs	15
BECKERS, J. M. / Effect of Progressive Alfvén Waves on the Profiles of Solar Spectral Lines	3
BECKERS, Jacques M., <i>see</i> Pasachoff, Jay M.	
BECKERS, Jacques M. / Photospheric Brightness Differences Associated with the Solar Supergranulation	309
BERGEY, J. A., <i>see</i> Argo, H. V.	
BHAVILAI, Rawi / The Bright Streaks in the H α Disk Chromosphere	471
BRAY, R. J. / High-Resolution Photography of the Solar Chromosphere. IV: Size, Shape, and Evolution of the Dark Mottles	323
CHAPMAN, G. A. and N. R. SHEELEY, Jr. / The Photospheric Network	442
CLINE, T. L. and F. B. McDONALD / Relativistic Electrons from Solar Flares	507
COVINGTON, A. E., <i>see</i> Basu, D.	
DONNELLY, R. F. / The X-Ray and Extreme Ultraviolet Radiation of the August 28, 1966 Proton Flare as Deduced from Sudden Ionospheric Disturbance Data	123
DRUZHININ, I. P., <i>see</i> Kukushkina, V. P.	
EMERSON, D. and E. A. MALLIA / Forbidden Lines of FeII in the Photospheric Spectrum	303
EVANS, W. D., <i>see</i> Argo, H. V.	
GREVESSE, Nicolas / Solar Abundances of Lithium, Beryllium and Boron	159
HOUSE, Lewis L., <i>see</i> Wagner, William J.	
HOWARD, Robert, <i>see</i> Wilcox, John M.	
HYDER, Charles L. / Polarized Light, Magnetographs, and Solar Magnetic Fields	29
HYDER, Charles L., <i>see</i> Saito, Kuniji	
KNEER, F. and W. MATTIG / Sunspot Intensities and their Correction for Scattered Light	42

KOPECKÝ, M. and V. OBRIDKO / On the Energy Release by Magnetic Field Dissipation in the Solar Atmosphere	354
KOZLOVSKY, Ben-Zion and Harold ZIRIN / The OVI Emission from the Sun	50
KOZLOVSKY, Ben-Zion / The Stages of Ionization of Oxygen and Helium in the Solar Wind	410
KRAFFT, Marina / Spectroscopic Investigation of a Birefringent Lyot-Filter for H α	462
KUKLIN, G. V., <i>see</i> Kukushkina, V. P.	
KUKUSHKINA, V. P., A. P. REZNIKOV, I. P. DRUZHININ, and G. V. KUKLIN / The Experience of Using the Determined-Probabilistic Learning Information System (DPLIS) for Solar Activity Forecasting	118
LAMBERT, D. L. and E. A. MALLIA / The Abundance of Chlorine in the Sun	181
LANDINI, M., B. C. MONSIGNORI FOSSI, G. POLETTI, and G. L. TAGLIAFERRI / The 44–60 Å Flux during the Ascending Period of the Solar Cycle No. 20 (1964–67)	546
LILLIEQUIST, Carl G., <i>see</i> Altschuler, Martin D.	
LINDGREN, S. T. / The Solar Particle Events of May 23 and May 28, 1967	382
LINGENFELTER, Richard E., <i>see</i> Ramaty, Reuven	
LOUGHHEAD, R. E. / High-Resolution Photography of the Solar Chromosphere	489
MACRIS, C. J. / A Remarkable Eruptive Prominence on the Solar Disk on January 29, 1968	361
MALLIA, E. A., <i>see</i> Lambert, D. L.	
MALLIA, E. A. / A Study of Weak Molecular and Atomic Lines in the Photospheric Spectrum	281
MALLIA, E. A., <i>see</i> Emerson, D.	
MALTBY, P. / Effect of Progressive Alfvén Waves on the Profiles of Solar Spectral Lines	3
MALVILLE, J. McKim / Magnetic Fields in Two Active Prominences	236
MARTRES, M.-J., R. MICHAUD, I. SORU-ISCOVICI et T. T. TSAP / Étude de la localisation des éruptions dans la structure magnétique évolutive des régions actives solaires	187
MATTIG, W., <i>see</i> Kneer, F.	
MCDONALD, F. B., <i>see</i> Cline, T. L.	
MEISEL, David D. / Identification of a Solar X-Ray Source Using D Layer Ionization Behavior during an Eclipse	575
MICHARD, R., <i>see</i> Martres, M.-J.	
MONSIGNORI FOSSI, B. C., <i>see</i> Landini, M.	
NAKAGAWA, Yoshinari, <i>see</i> Altschuler, Martin D.	
NESS, Norman F., <i>see</i> Schatten, Kenneth H.	
NOYES, Robert W., <i>see</i> Pasachoff, Jay M.	
OBRIDKO, V., <i>see</i> Kopecký, M.	
PASACHOFF, Jay M., Robert W. NOYES, and Jacques M. BECKERS / Spectral Observations of Spicules at Two Heights in the Solar Chromosphere	131

POLETO, G., <i>see</i> Landini, M.	
RAMATY, Reuven and Richard E. LINGENFELTER / Determination of the Coronal Magnetic Field and the Radio-Emitting Electron Energy from a Type IV Solar Radio Burst	531
REID, John H. / Cape Lyot H α -Heliograph Results. An Analysis of Flare Activity 1958-65	207
REZNIKOV, A. P., <i>see</i> Kukushkina, V. P.	
SAITO, Kuniji and Charles L. HYDER / A Concentric Ellipse Multiple-Arch System in the Solar Corona	61
SCHATTEN, Kenneth H., Norman F. NESS, and John M. WILCOX / Influence of a Solar Active Region on the Interplanetary Magnetic Field	240
SHEELEY, Jr., N. R., <i>see</i> Chapman, G. A.	
SHIMABUKURO, F. I. / A Comparison of 3.3-mm Bursts and H α Emission during Flares	498
SINGER, S., <i>see</i> Argo, H. V.	
SLOAN, William A. / Intensity Measurements of Chromospheric Fine Structures in Lyman- α	329
SMITH, Sheldon M., <i>see</i> Sturrock, P. A.	
SORU-ISCOVICI, I., <i>see</i> Martres, M.-J.	
STURROCK, P. A. and Sheldon M. SMITH / Magnetic-Field Structure Associated with Coronal Streamers	87
TAGLIAFERRI, G. L., <i>see</i> Landini, M.	
TLAMICHA, A. / The Spectrum of the Slowly Varying Component of Solar Radio Emission at Wavelengths of 3.3 mm - 21 cm	377
TSAP, T. T., <i>see</i> Martres, M.-J.	
WAGNER, William J. and Lewis L. HOUSE / A Survey of Current Coronal Visible Line Identifications	55
WARWICK, James W. / A Model for Type-IV Emission in the Solar Burst of June 9, 1959 at Decametric Wavelengths	111
WILCOX, John M., <i>see</i> Schatten, Kenneth H.	
WILCOX, John M. and Robert HOWARD / A Large-Scale Pattern in the Solar Magnetic Field	564
WILSON, P. R. / The Structure of a Sunspot. IV: A Two-Dimensional Radiative Transfer Analysis of Center-Limb Intensity Profiles	338
ZIRIN, Harold, <i>see</i> Kozlovsky, Ben-Zion	
ZIRIN, Harold / George Ellery Hale, 1868-1938	435

RESEARCH NOTES

BANIN, V. G. / An Explanation of the Electron Density Value in Solar Flares	127
JACOBS, A. / On the Temperature Dependence of the Ratio of O $VIII$ Ly- α and Ly- β Radiation from the Solar Corona	359

REPORTS FROM SOLAR INSTITUTES

DODSON, Helen W., <i>see</i> Mohler, Orren C.	
MOHLER, Orren C. and Helen W. DODSON / McMath-Hulbert Observatory of the University of Michigan	417
WALDMEIER, M. / The Swiss Federal Observatory, Zürich	423

ABSTRACTS OF PAPERS FROM OTHER JOURNALS

Bahcall, John N., Neta A. Bahcall, and Giora Shaviv: 'Present Status of the Theoretical Predictions for the ^{36}Cl Solar-Neutrino Experiment', <i>Phys. Rev. Letters</i> 20 (1968), 1209. (JAY M. PASACHOFF)	588
Davis, Raymond, Jr., Don S. Harmer, and Kenneth C. Hoffman: 'Search for Neutrinos from the Sun', <i>Phys. Rev. Letters</i> 20 (1968), 1205. (JAY M. PASACHOFF)	588
Durassova, M. S., G. A. Lavrinov, O. I. Judin: 'On Faint Microwave Bursts of the Solar Radio Emission', <i>Soln. Dann.</i> 12 (1967), 110. (G. Y. VASSILYeva)	590
Frazier, Edward N.: 'An Observational Study of the Hydrodynamics of the Lower Solar Photosphere', <i>Astrophys. J.</i> 152 (1968), 557. (JAY M. PASACHOFF)	588
Gasanalizade, A. G.: 'On the Lindholm Shift on the Solar Lines', <i>Soln. Dann.</i> 10 (1967), 77. (G. Y. VASSILYeva)	588
Hartle, R. E. and P. A. Sturrock: 'Two-Fluid Model of the Solar Wind', <i>Astrophys. J.</i> 151 (1968), 1155. (A. K. DUPREE)	428
Huber, Martin and Frank L. Tobey, Jr.: 'gf-Values of Ultraviolet FeI, CrI and CrII Lines from Shock-Tube Measurements', <i>Astrophys. J.</i> 152 (1968), 609. (JAY M. PASACHOFF)	591
Kassinsky, V. V.: 'The Bright Ring and the Magnetic Spot Boundary', <i>Soln. Dann.</i> 2 (1967), 59. (G. J. VASSILYeva)	427
Korzhavin, A. N. and N. G. Peterova: 'On the Sizes of Local Sources of Solar Radio Emission at the Wavelength of 4.5 cm', <i>Astron. Zh. (U.S.S.R.)</i> 45 (1968), 36. (N. N. STEPANYAN)	428
Kuli-Zade, D. M.: 'On the Effect of the Parity Terms on the Curve of Growth', <i>Astron. Zh. (U.S.S.R.)</i> 45 (1968), 69. (N. N. STEPANYAN)	427
Leacock, R. A., W. I. Beavers, and C. T. Daub: 'A Search for Fractionally Charged Particles in the Solar Photosphere', <i>Astrophys. J.</i> 151 (1968), 1179. (A. K. DUPREE)	427
Peyturaux, R.: 'La mesure absolue de l'énergie émise par le centre du disque solaire de 4477 à 8638 Å', <i>Ann. Astrophys.</i> 31 (1968), 227. (J.-C. HENOUX)	589
Saito, K. and N. Owaki: 'An Active Region Streamer of the Solar Corona', <i>Publ. Astron. Soc. Japan</i> 19 (1967), 535. (Y. UCHIDA)	427
Slonim, J. M.: 'Flares, Filaments and Loop Prominences', <i>Astron. Zh.</i> 45 (1968), 286. (N. STEPANYAN)	590
Van Allen, J. A.: 'Solar X-Ray Flares on May 23, 1967', <i>Astrophys. J.</i> 152 (1968), L85. (JAY M. PASACHOFF)	589
Waddell III, J. H.: 'An Empirical Determination of the Continuum Source Function in the Solar Photosphere', <i>Astrophys. J.</i> 152 (1968), 577. (JAY M. PASACHOFF)	589
Widing, Kenneth G. and Glenn D. Sandlin: 'Analysis of the Solar Spectrum in the Spectral Range 33–110 Å', <i>Astrophys. J.</i> 152 (1968), 545. (JAY M. PASACHOFF)	590
Wilcox, John M. and Robert Howard: 'Persistent Solar Magnetic Pattern Extending Over Equatorial Latitudes', <i>Phys. Rev. Letters</i> 20 (1968), 1252. (JAY M. PASACHOFF)	589
Zheleznyakov, V. V. and V. V. Zaitsev: 'On the Origin of Solar Bursts of Type V', <i>Astron. Zh. (U.S.S.R.)</i> 45 (1968), 19. (N. N. STEPANYAN)	428

ABSTRACTS OF FORTHCOMING PAPERS

429, 592